

FIG. 1A

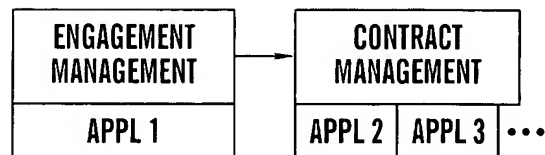


FIG. 1B

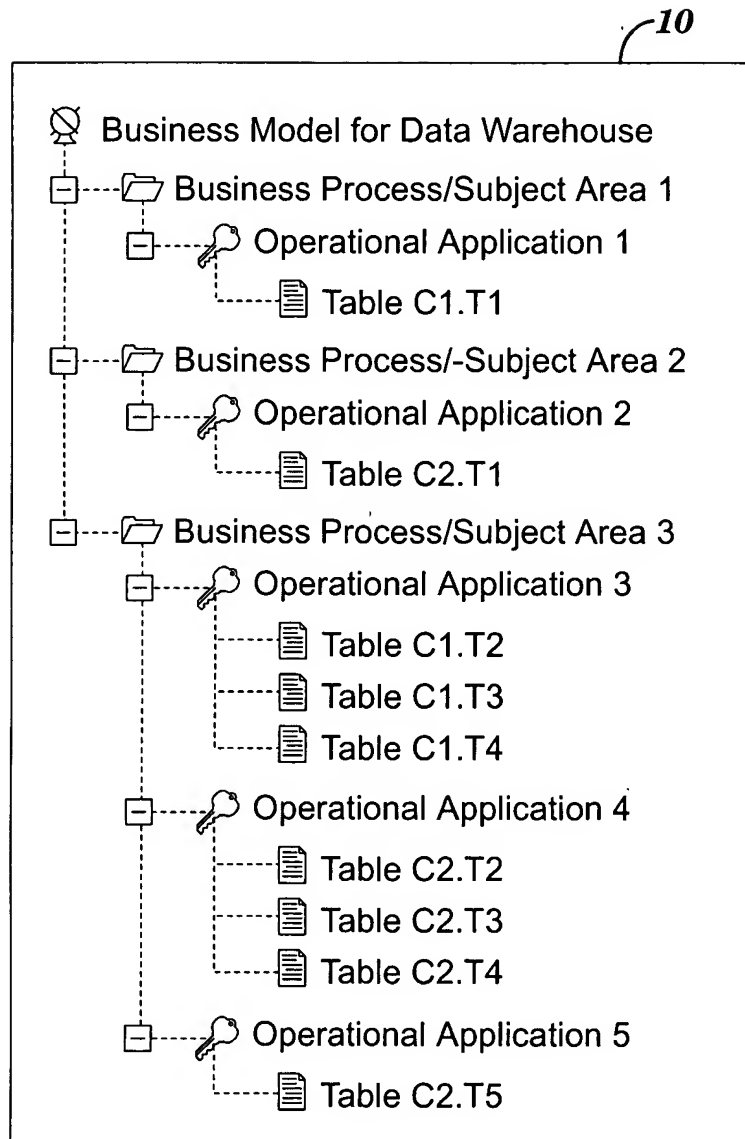


FIG. 2A

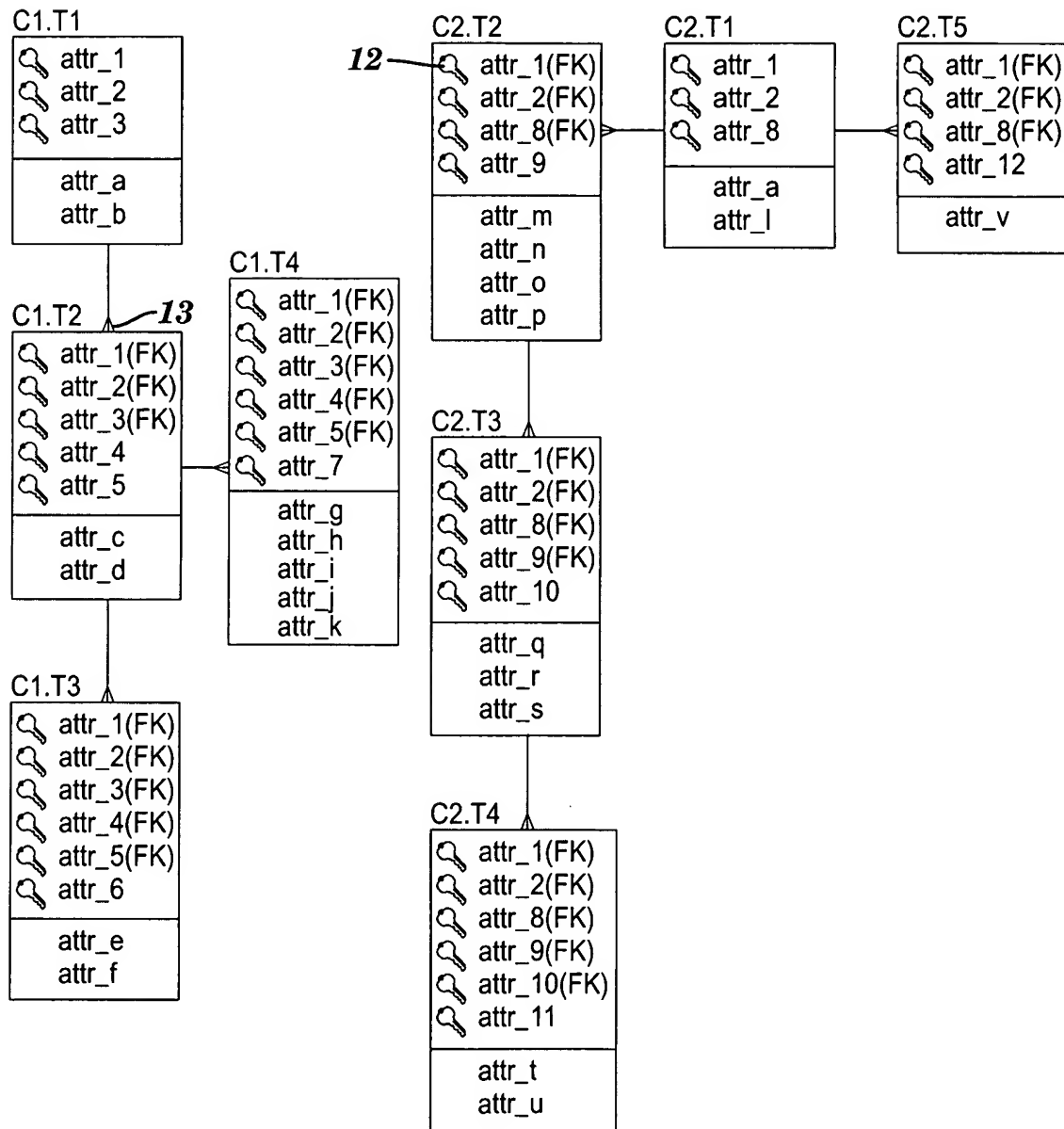


FIG. 2B

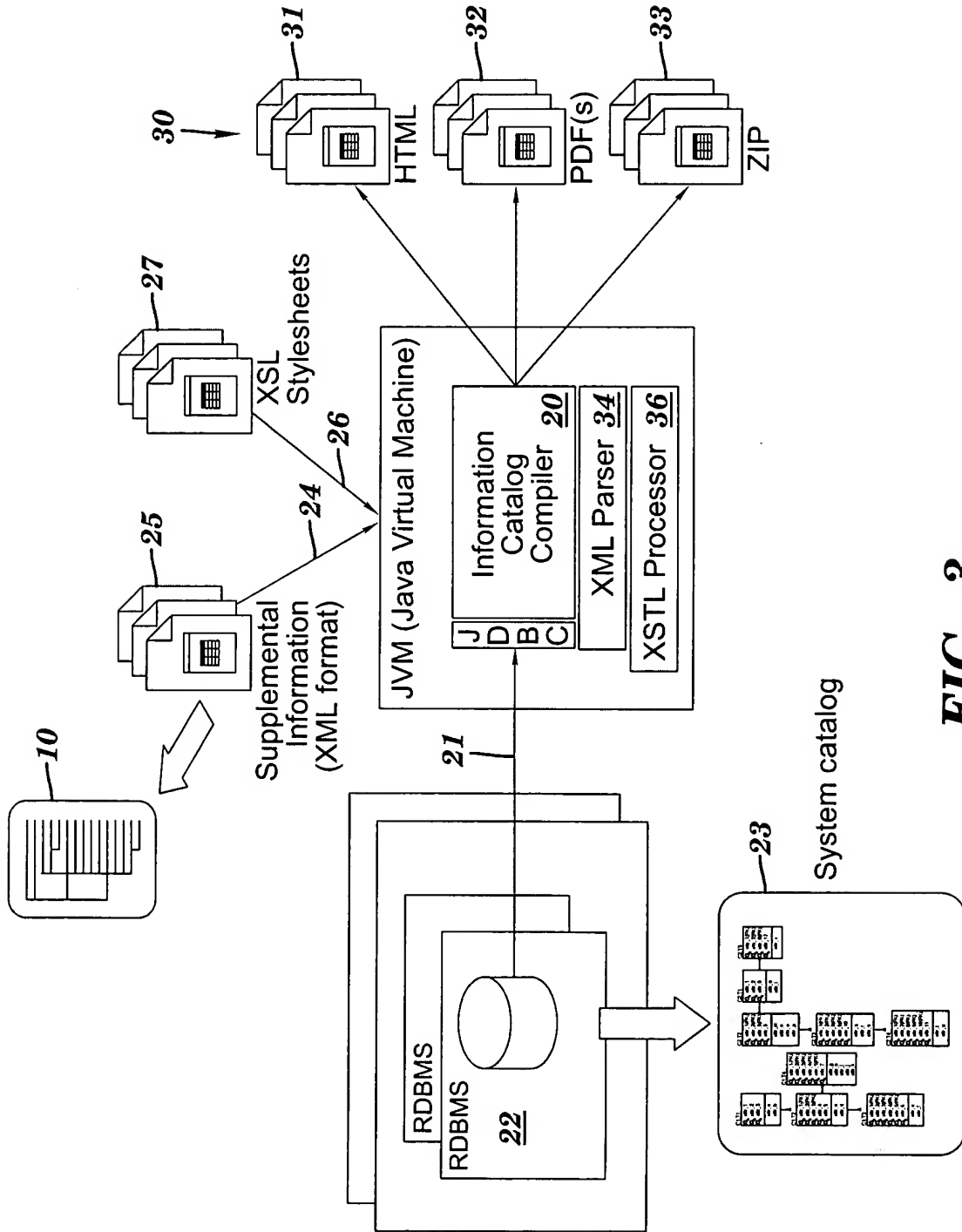


FIG. 3

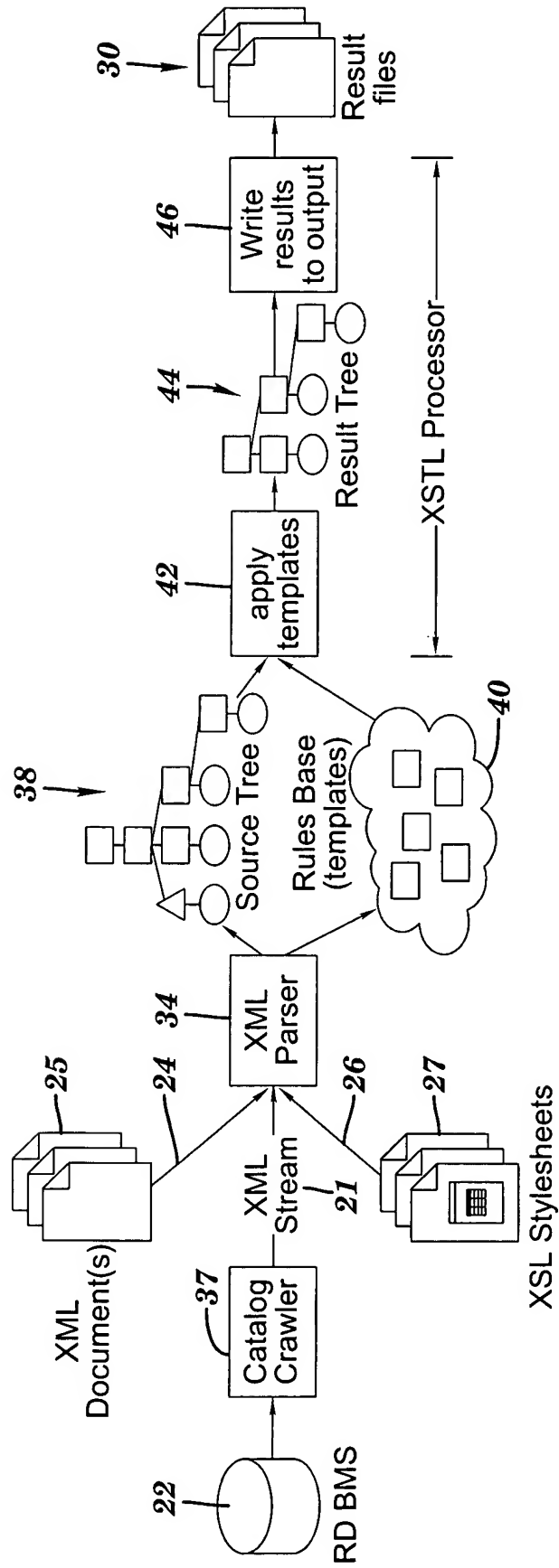


FIG. 4

Root Element in XML Document.

```
<?xml version="1.0"?>
<info-catalog
  rootname="ICCEExample"
  xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="file:///ICC.xsd"
  documenttitle="Information Catalog Compiler, Example, v 1.0"
  header="Data Warehouse Name Std. Ed. v1.0"
  contact="contact-address@your.site.com"
  columnXRef="no"
  sortByColumnName="no"
  security="IBM internal use only"
>
```

FIG. 5

Defined Elements in XML Document

```
<creators>
  <name>c1</name>
  <name>c2</name>
</creators>
<description>
  <p>
    This element should contain a description of the
    Data Warehouse's overall functionality. Any
    standard, well-formed HTML can be contained within
    the description element; this may include lists,
    tables, images, links, or multimedia objects.
  </p>
</description>
<footer>
  <p>
    <br/>This catalog was generated by IBM
    Global Service IS&LS InfoCatalog Compiler
    on &systime;.
  </p>
</footer>
<bottom>
  <p>For further reference documentation, see
    <a href="http://your.site.com/any-
    document">Any other documents</a>. Any
    standard, well-formed HTML can be contained at
    the bottom.
  </p>
</bottom>
```

FIG. 6

XML Code For A Portion Of The Business Model of FIG. 2

```
<subjectarea>Business Process/Subject Area 3>
  <application>
    <name>Operational Application 3</name>
    <abbr>APPL-3</abbr>
    <label>APPL-3</label>
    <desc>
      <p>
        This section can contain significant detail,
        graphics, even video. As long as the content
        is marked up in well formed HTML
      </p>
    </desc>
  </application>
  <application>
    <name>Operational Application 4</name>
    <abbr>APPL-4</abbr>
    <tablelist>
      <table>
        <creator>C2</creator>
        <name>T2</name>
      </table>
      <table>
        <creator>C2</creator>
        <name>T3</name>
      </table>
      <table>
        <creator>C2</creator>
        <name>T4</name>
      </table>
    </tablelist>
    <desc>
      <p>
        This section can contain significant detail,
        graphics, even video. As long as the content
        is marked up in well formed HTML
      </p>
    </desc>
  </application>
  <application>
    <name>Operational Application 5</name>
    <abbr>APPL-5</abbr>
    <tablelist>
      <table>
        <creator>C2</creator>
        <name>T5</name>
      </table>
    </tablelist>
    <desc>
      <p>
        This section can contain significant detail,
        graphics, even video. As long as the content
        is marked up in well formed HTML
      </p>
    </desc>
  </application>
```

FIG. 7

Sample Lines Of "build-table-summary.xml" File

```
1      <xsl:template match="info-catalog" mode="build-table-
      summary">

2          <xsl:variable name="curDir" select="@rootname"/>

3          <xsl:for-each select="creator">
4              <xsl:variable name="creatorNumber"
      select="position()"/>
5              <xsl:variable name="creatorName"
      select="position()"/>

6              <xsl:for-each select="table">
7                  <xsl:variable name="tableNumber"
      select="position()"/>
8                  <xsl:variable name="priorTableNumber"
      select="position()-1"/>
9                  <xsl:variable name="nextTableNumber"
      select="position()+1"/>
10                 <redirect:write select="concat($curDir,
      $fileSep, 'creator', $fileSep, $creatorName,$fileSep,
      $tableName, '-summary.html')">

11                     <html lang="en-US"
12                     xmlns="http://www.w3.org/1999/xhtml">
13                         <!--
14                         *****
15                         Add Navigator
16                         use template icc-navigator defined in
17                         icc-style.
18                         *****-->
19                         <xsl:call-template name="icc-navigator">
20                             <xsl:with-param name=" creator-number "
      select="$creatorNumber"/>
21                             <xsl:with-param name=" creator-number "
      select="$tableNumber"/>
22                             <xsl:with-param name="title"
      select="../title"/>
23                             <xsl:variable name="type" select="'Table'"/>
24                         </xsl:call-template>

25                     <body bgcolor="#ffffff" marginheight="0"
      marginwidth="0" leftmargin="0" topmargin="0"
      onUnload="xclosepopup() ">
26                         ...
27                     </body>
28                 </redirect:write>
29             </xsl:for-each>
30         </xsl:for-each>
31     </xsl:template>
```

FIG. 8

Explanations of Lines 1-9 of FIG. 8.

Line	Explanation
1	Defines the template by name and mode. Thus the XSL <code><xsl:apply-template select="info-catalog" mode="build-table-summary"/></code> would match this template and the XML would begin rendering from the root element "info-catalog".
2	Set the variable <code>currDir</code> to the value of the <code>rootname</code> attribute of the <code>info-catalog</code> element. This variable will be used to specify the qualified file name the output should be written to.
3	Begins a loop that will process each table creator XML element within the XML stream (note that information pulled from the RDBMS's system catalog is internally represented in XML).
4	Set variable to retain the relative number of the current creator. This variable will be used to derive the prior and next table when processing individual table information.
5	Set variable to retain the current creator name. This variable will be used when processing tables for each creator and to specify the qualified file name the output should be written to.
6	Begins a loop that will process each table XML element within the table creator XML element.
7	Set variable to retain the relative number of the current table. This is subsequently used to derive the prior and next table.
8	Set variable to retain the relative number of the prior table. This is subsequently used to derive the prior and next table.
9	Set variable to retain the relative number of the next table. This is subsequently used to derive the prior and next table.

FIG. 9A

Explanations of Lines 10-19 of FIG. 8.

Line	Explanation
10	Begin a redirected write element to redirect all output contained within the element to the qualified file specified. In the example presented herein, running on an Windows platform, this would be ICCEExample\creator\Cx\Ty-summary.html
11	Output the first line of rendered HTML, that being the initial HTML tag.
12	Comment (lines)
13	Begin the apply/call the template element to render the common top navigation bar. The template's name is icc-navigator. Note that no mode is specified, since all detail pages have a common navigator bar. By means of being included in the redirected write element, the resulting rendered navigator bar will be written to the redirected file.
14	Pass the creator number to the icc-navigator template by means of a template parameter.
15	Pass the table number to the icc-navigator template by means of a template parameter.
16	Pass the value of the title "ancestor" element to the icc-navigator template by means of a template parameter. The "../" is used to match the element to an ancestor of the table element.
17	Pass the literal value of 'Table' to the icc-navigator template by means of a template parameter. This tells the template that the navigator bar will be used for a table detail page.
18	End the apply template element.
19	Write out the HTML body tag.

FIG. 9B

List of XSL Stylesheets

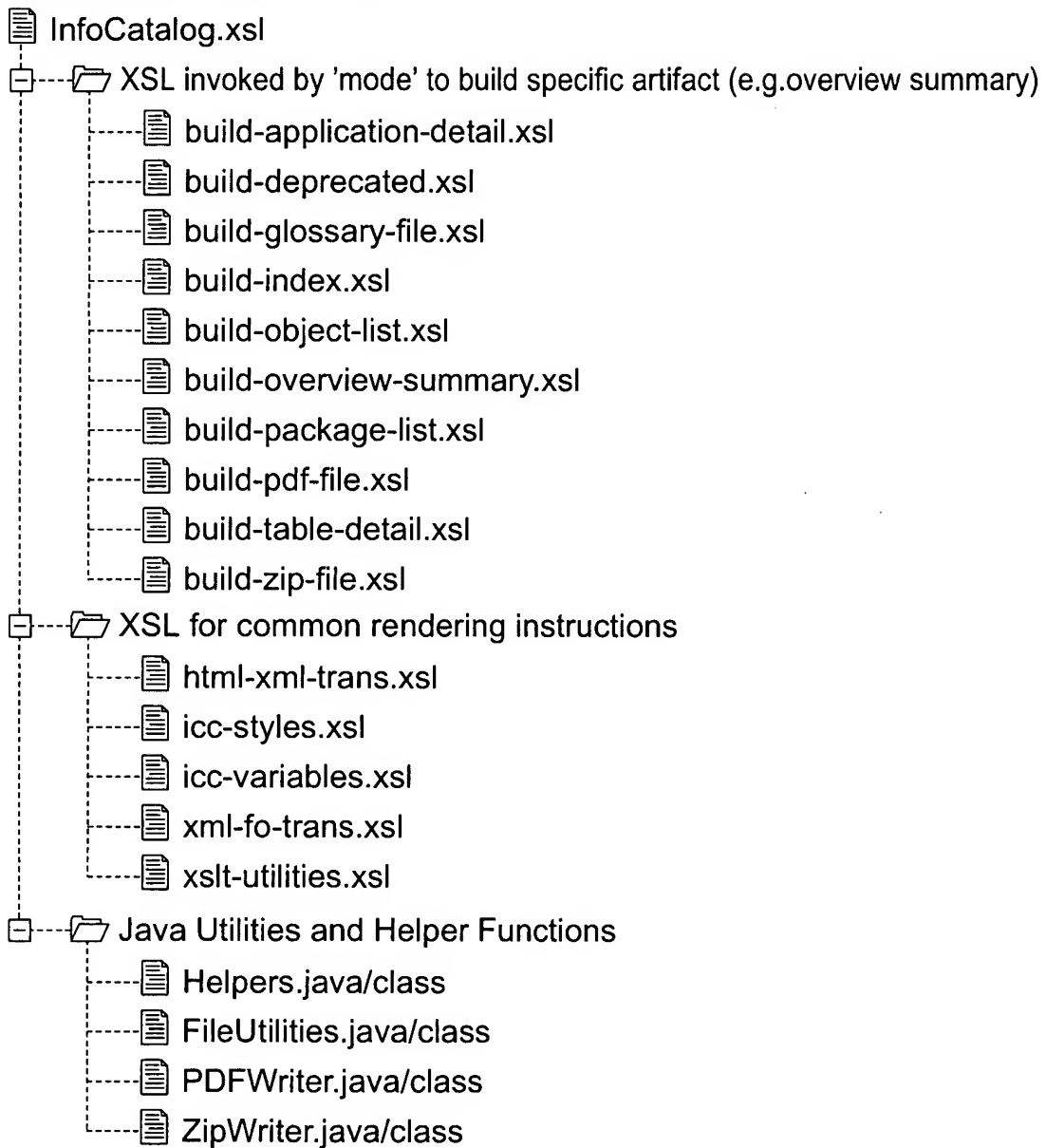


FIG. 10

Transformation Template

```
1  <xsl:template match="table">
2    <table>
3      <xsl:for-each select="@*">
4        <xsl:attribute name="{name()}">
5          <xsl:value-of select="."/>
6        </xsl:attribute>
7      </xsl:for-each>
8      <xsl:for-each select="table-row | tr">
9        <tr>
10       <xsl:for-each select="@*">
11         <xsl:attribute name="{name()}">
12           <xsl:value-of select="."/>
13         </xsl:attribute>
14       </xsl:for-each>
15
16       <xsl:for-each select="table-cell | td">
17         <td>
18           <xsl:for-each select="@*">
19             <xsl:attribute name="{name()}">
20               <xsl:value-of select="."/>
21             </xsl:attribute>
22           </xsl:for-each>
23
24           <xsl:apply-templates select="*|text()" />
25
26         </td>
27       </xsl:for-each>
28
29     </tr>
30   </xsl:for-each>
31 </table>
32 </xsl:template>
```

FIG. 11

Result Files of Information Catalog

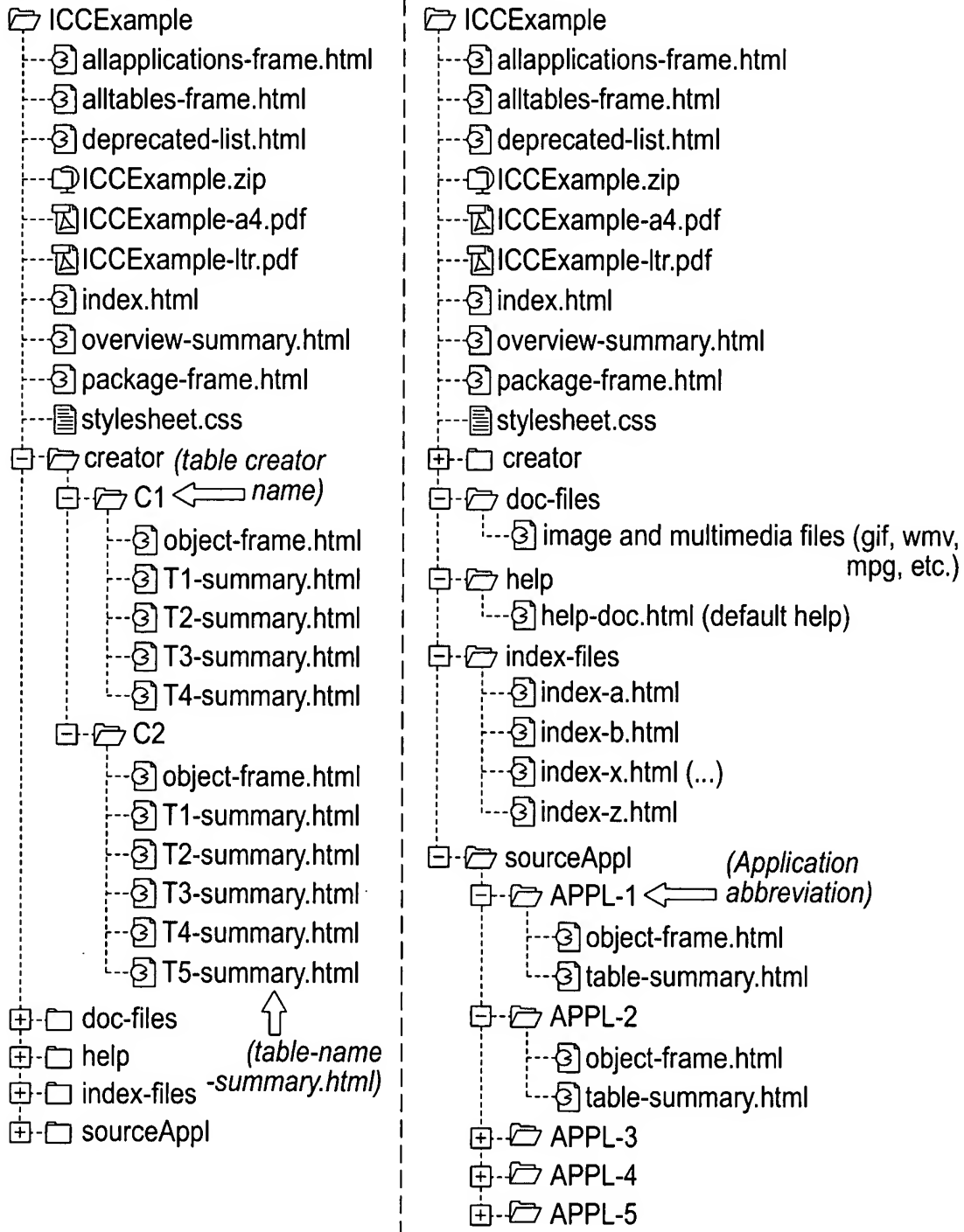


FIG. 12

Package List Frame.

Data Warehouse Name
Std. Ed. v1.0

All Tables

← ■ Link to all tables

All Applications

← ■ Link to all source applications

Applications

APPL-1

APPL-2

← ■ Link to source application specific tables, by application abbreviation

APPL-3

APPL-4

APPL-5

Table Creators

C1

← ■ Link to tables with specific creator name

C2

FIG. 14

Object List Frame.

All Tables <u>C1.T1</u> <u>C1.T2</u> <u>C1.T3</u> <u>C1.T4</u> <u>C2.T1</u> <u>C2.T2</u> <u>C2.T3</u> <u>C2.T4</u> <u>C2.T5</u> All Tables selected from Package List Frame	All Applications <u>APPL-1</u> <u>APPL-2</u> <u>APPL-3</u> <u>APPL-4</u> <u>APPL-5</u> All Applications selected from Package List Frame
APPL-3 <u>C1.T2</u> <u>C1.T3</u> <u>C1.T4</u> All Tables for an application selected from Package List Frame	C1 <u>T1</u> <u>T2</u> <u>T3</u> <u>T4</u> All Tables for a creator name selected from Package List Frame

FIG. 15

Navigation Bar.

Overview	Table	<u>Deprecated</u>	<u>Index</u>	<u>Help</u>	<i>Data Warehouse Name</i>
Prev	Next	<u>FRAMES</u>	<u>NO FRAMES</u>		<i>Std. Ed. v1.0</i>

FIG. 16

Glossary Term.


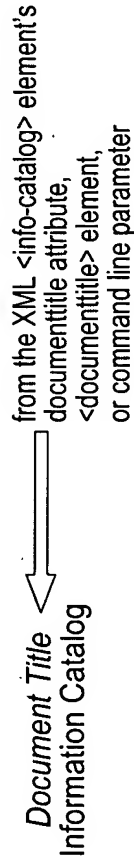
Glossary Term
Definition of the glossary term.
<hr/>
 Print → Close

FIG. 17

Links Contained In Overview Summary Page.



Abstract from the <abstract> tag or defaulted using the <documenttitle> tag

See:

Description (links user to a description of the Data Warehouse's overall function, below in the page. The description is taken from the <description> tag)

Source Application Hierarchy:

- Functional Area Name (links user to a function area table below in the page)
 - + -- Source Appl Abbr Source Application Name
(links user to an application within the function area table below in the page)
 - + -- Source Appl Abbr repeated as needed Source Application Name
- Functional Area Name repeated as needed

Top

Functional Area Name - repeats for each functional area	
Source Appl Abbr Source Application Name Hyperlinked to application summary page for the source application. Repeats for each application under the functional area.	Detailed business description of the source application.

Top

Document Title

Description of Data Warehouse Platform...from the <description> tag

Overview Summary.

Overview	Table	Deprecated	Index	Help	<i>Data Warehouse Name</i> <i>Std. Ed. v1.0</i>
PREV	NEXT	FRAMES	NO FRAMES		

Information Catalog Compiler, Example, v1.0
Information Catalog

This document provides an overview and database specification for the Information Catalog Compiler, Example, v1.0.

See:
[Description](#)
Subject Area/Source Application Hierarchy:

- [Business Process/Subject Area 1](#)
 - + -- [APPL- 1](#) Operational Application 1
- [Business Process/Subject Area 2](#)
 - + -- [APPL- 2](#) Operational Application 2
- [Business Process/Subject Area 3](#)
 - + -- [APPL- 3](#) Operational Application 3
 - + -- [APPL- 4](#) Operational Application 4
 - + -- [APPL- 5](#) Operational Application 5

[Top](#)

Business Process/Subject Area 1	
APPL- 1 Operational Application 1	This section can contain significant detail, graphics, even video. As long as the content is marked up in well formed HTML.

[Top](#)

Business Process/Subject Area 2	
APPL- 2 Operational Application 2	This section can contain significant detail, graphics, even video. As long as the content is marked up in well formed HTML.

FIG. 19

Links Contained In Application Summary Page.

Functional Area Application Abbreviation & Name			
<i>Application Attributes</i>			
Update Frequency	e.g. nightly, weekly, 1X, 1W, realtime	Extract Method	Description of how the data is extracted, e.g. DB2 Unload, DPropR Capture.
Transformation Rule	Description of or reference to how the data is transformed, if applicable.	Population Method	Description of how the data is populated, e.g. DB2 Load, DPropR Apply.
<i>Description of the application from a business perspective.</i>			
<u>Top</u>			
Table Summary			
creator. Table Name linked to the table detail page		Business information describing the contents and purpose of the table within the source application.	

FIG. 20

Application Summary Frame.

Overview Application Deprecated Index Help				<i>Data Warehouse Name</i> <i>Std. Ed. v1.0</i>												
PREV APPL NEXT APPL FRAMES NO FRAMES																
<p><i>Business Process/Subject Area 2</i> APPL-2 Operational Application 2</p> <p style="text-align: center;"><i>Application Attributes</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 15%;">Update Frequency</td><td style="width: 35%;">e.g. nightly, weekly, 1X, 1W, realtime</td><td style="width: 15%;">Extract Method</td><td style="width: 35%;">Description of how the data is extracted, e.g. DB2 Unload, DPropR Capture.</td></tr><tr><td>Transformation Rule</td><td>Description of or reference to how the data is transformed.</td><td>Population Method</td><td>Description of how the data is populated, e.g. DB2 Load, DPropR Apply.</td></tr></table> <p>This section can contain significant detail, graphics, even video. As long as the content is marked up in well formed HTML.</p> <p>Top</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td colspan="2" style="text-align: center;">Table Summary</td></tr><tr><td style="width: 15%;">C2.T1</td><td>Description of table T1 with schema/creator name C2.</td></tr></table>					Update Frequency	e.g. nightly, weekly, 1X, 1W, realtime	Extract Method	Description of how the data is extracted, e.g. DB2 Unload, DPropR Capture.	Transformation Rule	Description of or reference to how the data is transformed.	Population Method	Description of how the data is populated, e.g. DB2 Load, DPropR Apply.	Table Summary		C2.T1	Description of table T1 with schema/creator name C2.
Update Frequency	e.g. nightly, weekly, 1X, 1W, realtime	Extract Method	Description of how the data is extracted, e.g. DB2 Unload, DPropR Capture.													
Transformation Rule	Description of or reference to how the data is transformed.	Population Method	Description of how the data is populated, e.g. DB2 Load, DPropR Apply.													
Table Summary																
C2.T1	Description of table T1 with schema/creator name C2.															
Overview Application Deprecated Index Help				<i>Data Warehouse Name</i> <i>Std. Ed. v1.0</i>												
PREV APPL NEXT APPL FRAMES NO FRAMES																
<p>Submit a bug or feature or send note to contact-address@your.site.com For further reference and developer documentation, see Any other documents. Any standard, well formed HTML can be contained at the bottom.</p> <p>This catalog was generated by IBM Global Service IS&LS InfoCatalog Compiler on Thu Jan 08 21:52:07 EST 2004.</p>																

FIG. 21

Format For Table Attributes.

Table Attributes

Cardinality:?	###, ###	# Pages:?	###, ###	DB Name:	<i>database name</i>
# Column:?	###, ###	Pct. Pages:?	###, ###	TS Name:	<i>Tablespace name</i>
# Key Columns:?	###	# Parents:?	###		
Record Length:?	###	# Children:?	###, ###		

Created: YYYY-MM-DD HH:MM:SS.ssssss

Last Altered: YYYY-MM-DD HH:MM:SS.ssssss

Last Statistics: YYYY-MM-DD HH:MM:SS.ssssss

FIG. 22

Table Attributes	
Cardinality	The total number of rows in the table as of the last time statistics were gathered. The value is -1 if statistics have not been gathered or the row describes a view, alias, or temporary table.
# Columns	The total number of in the table or view as of the last time statistics were gathered. The value is -1 if statistics have not been gathered or 0 if the row describes an alias table.
# Keys Columns	The total number of columns in the in the table's primary key as of the last time statistics were gathered. The value is -1 if statistics have not been gathered or 0 if the row describes a view, alias, or temporary table.
Record Length	<p>For tables, the maximum length of any record in the table.* Length is $8+N+L$, where:</p> <ul style="list-style-type: none"> ◦ The number 8 accounts for the header (6 bytes) and the id map entry (2 bytes).* ◦ N is 10 if the table has an edit procedure, or 0 otherwise. ◦ L is the sum of the maximum column lengths. In determining a column's maximum length, add a byte for the null indicator if the column allows nulls. Add 2 bytes for its length indicator if the column has a varying length data type (e.g. VARCHAR). <p>The value is 0 if the row describes a view or alias.</p>
# Pages	The total number of pages on which rows of the table appear as of the last time statistics were gathered. The value is -1 if statistics have not been gathered or the row describes a view, alias, or temporary table.
Pct. Pages	Percentage of active table space pages that contain rows of the table. A page is termed active if it is formatted for rows, regardless of whether it contains any. If the table space is segmented, the percentage is based on the number of active pages in the set of segments assigned to the table. The value is -1 if statistics have not been gathered or the row describes a view, an alias, or a temporary table.
# Parents	The number of relationships in which the table is a dependent. The value is 0 if the row describes a view, an alias, or a temporary table.
# Children	The number of relationships in which the table is a parent. The value is 0 if the row describes a view, an alias, or a temporary table.
DB Name	For a table, or a view of tables, the name of the database that contains the tablespace named in TS Name. For a temporary table, an alias, or a view of a view, the value is DSNDB06.*
TS Name	For a table, or a view of one table, the name of the table space that contains the table. For a view of more than one table, the name of a table space that contains one of the tables. For a temporary table, the value is SYSPKAGE. For a view of a view, the value is SYSVIEWS. For an alias, it is SYSDBAUT.*
Created	The time when the CREATE statement was executed for the table, view, or alias.
Last Altered	For a table, the time when the last ALTER TABLE statement was applied. If no ALTER TABLE statement has been applied, or if the row is for a view or alias, ALTEREDTS has the value of CREATEDTS.

FIG. 23

Column Summary - <i>table-name</i>	
Column Name	Business Description of Column See Also: <u><i>tableCreator.tableName1</i></u> , <u><i>tableCreator.tableName2</i></u> , ... <u><i>tableCreator.tableNameN</i></u>

FIG. 24

Top

Column Schema - <i>creator.table_name</i>							
Name	#	Type?	Length?	Scale?	Nulls?	Key Seq?	Cardinality?
Column Name	##	data type	##	##	Nulls	##	###, ###

FIG. 25

Column Schema	
Column Name	Name of the column
#	Numeric place of the column within the table or view.
Type	The data type of the column specified in the definition of the column.
Length	The length attribute of the column or, in the case of a decimal column, its precision. The number does not include the internal prefixes used to record actual length and null state, where applicable.
Scale	Scale of decimal data. Zero if not a decimal column.
Nulls	<p>Whether the column can contain null values:</p> <ul style="list-style-type: none">• N No• Y Yes <p>The value can be N for a view column that is derived from an expression or a function. Nevertheless, such a column allows nulls when it is referenced in an outer select list.</p>
Key Seq	Column Key Sequence Number - The column's numeric position within the table's primary key. 0 if it is not part of a primary key.
Cardinality	Estimated number of distinct values in the column, as of the last time statistics were gathered. The value is -1 if statistics have not been gathered or the row describes a view, alias, or temporary table.

FIG. 26

Top

Indices - <i>creator.table_name</i>			
<i>index_name</i> - key type (e.g. primary, duplicates). Repeats for every index.			
Clustering: <i>Y/N</i> Clustered: <i>Y/N</i> Cluster Ratio: <i>###?</i>		Created on: <i>YYYY-MM-DD HH:MM:SS.sssss</i> Statistics last run: <i>YYYY-MM-DD HH:MM:SS.sssss</i>	
Col Name	Col #	Col Seq	Ordering
<i>column name</i>	<i>###</i>	<i>###</i>	<i>Asc/Descending</i>

FIG. 27

Indices Attributes	
Index Name	DB2 name of the index
Key Type	<p>The type of index.</p> <ul style="list-style-type: none"> • Primary Key (unique by definition) • Unique (but not primary key) • Duplicates
Clustered, Clustering, and Cluster Ratio	<p>Clustered Indicates whether the table is actually clustered (ordered) by the index.</p> <p>Clustering Indicates whether the index was created using CLUSTER.</p> <p>Cluster Ratio The percentage of rows that are in clustering order. The cluster ration gives an indication of how closely the order of the index entries on the index leaf pages matches the actual ordering of the rows on the data pages. The closer CLUSTERRATIO is to 100%, the more closely the ordering of the index entries matches the actual ordering of the rows on the data pages.</p> <p>The higher the ration the better the performance for queries that retrieve data in the clustering order. A value greater than 60 is considered to be good.</p> <p><u>The importance of clustering</u></p> <p>When a table has a clustering index, records are organized, as nearly as possible in the order of their index values. These clustered inserts can provide a significant performance advantage in some operations, particularly those that involve many records, such as grouping, ordering, and comparisons other than equal. Although a table can have several indexes, only one of them can be a clustering index.</p> <p>Clustering can also help DB2 exploit Sequential Prefetch: Sequential prefetch is performed concurrently with other operations of the originating application program. It brings pages into the virtual buffer pool before they are required and reads several pages with a single I/O operation.</p> <p>Sequential prefetch can be used to read data pages, by table space scans or index scans with clustered data reference.</p> <ul style="list-style-type: none"> • Cluster Ration is an important input to the cost estimates that are used to determine whether an index is used for an access path, and, if so, which index to use. • If the access is INDEXONLY, then this value does not apply. • The higher the CLUSTERRATIO value, the lower the cost of referencing data pages during an index scans. • For an index that has a CLUSTERRATIO less than 80%, sequential prefetch is not used to access the data pages.
Created on	The time when the CREATE statement was executed for the index.
Statistics last run	If RUNSTATS updated the statistics, the date and time when the last invocation of RUNSTATS updated the statistics for the index. The default value is '0001-01-01.00.00.00.000000'.
Col Name	Name of the column used in the index.
Col #	Numeric place of the column within the table.
Col Seq	Numeric place of the column within the index.
Ordering	<p>Order of the column in the key.</p> <ul style="list-style-type: none"> • A - Ascending • D — Descending

FIG. 28A

Indices Attributes	
Col #	Numeric place of the column within the table.
Col Seq	Numeric place of the column within the index.
Ordering	Order of the column in the key. <ul style="list-style-type: none">• A - Ascending• D - Descending

FIG. 28B

Top

Relationships - <i>creator.table_name</i>		
with: <u><i>creator.table_name</i></u> (Hyperlinked to referenced table) Delete Rule: <i>Restrict/Delete/Cascade</i> Created On: <i>YYYY-MM-DD HH:MM:SS:ssssss</i>		
Col Name	Col #	Col Seq
<i>column name</i>	<i>###</i>	<i>###</i>

FIG. 29

Relationship Attributes	
with: <i>creator.table_name</i>	Name of the table that the current table has a relationship with. This name is linked to the index section of the 'related' table.
Delete Rule	Type of delete rule for the referential constraint. <ul style="list-style-type: none">• Cascade• Set Null• Restrict• No Action
Created on	The time when the CREATE statement was executed for the relationship.
Col Name	Name of the column used in the relationship.
Col #	Numeric place of the column within the table.
Col Seq	Numeric place of the column within the relationship.

FIG. 30

Overview Table Deprecated Index Help		<i>Data Warehouse Name</i> <i>Std. Ed. v1.0</i>					
PREV NEXT		FRAMES NO FRAMES					
<hr/>							
<h3>Deprecated Tables</h3>							
<p>This page lists all of the Information Catalog Compiler, Example, v1.0 tables that have been deprecated. A deprecated table is not recommended for use, generally due to improvements, and a replacement table is usually given. Deprecated tables may be removed in future implementations of the Information Catalog Compiler, Example, v1.0.</p>							
<table><tr><th colspan="2">Deprecated Tables</th></tr><tr><td><u><i>creator-name.TABLE-NAME</i></u></td><td><i>Business description of table.</i> Replaced with: <u><i>creator-name.TABLE-NAME1, ... , creator-name.TABLE-NAME_n</i></u></td></tr></table>				Deprecated Tables		<u><i>creator-name.TABLE-NAME</i></u>	<i>Business description of table.</i> Replaced with: <u><i>creator-name.TABLE-NAME1, ... , creator-name.TABLE-NAME_n</i></u>
Deprecated Tables							
<u><i>creator-name.TABLE-NAME</i></u>	<i>Business description of table.</i> Replaced with: <u><i>creator-name.TABLE-NAME1, ... , creator-name.TABLE-NAME_n</i></u>						

FIG. 31

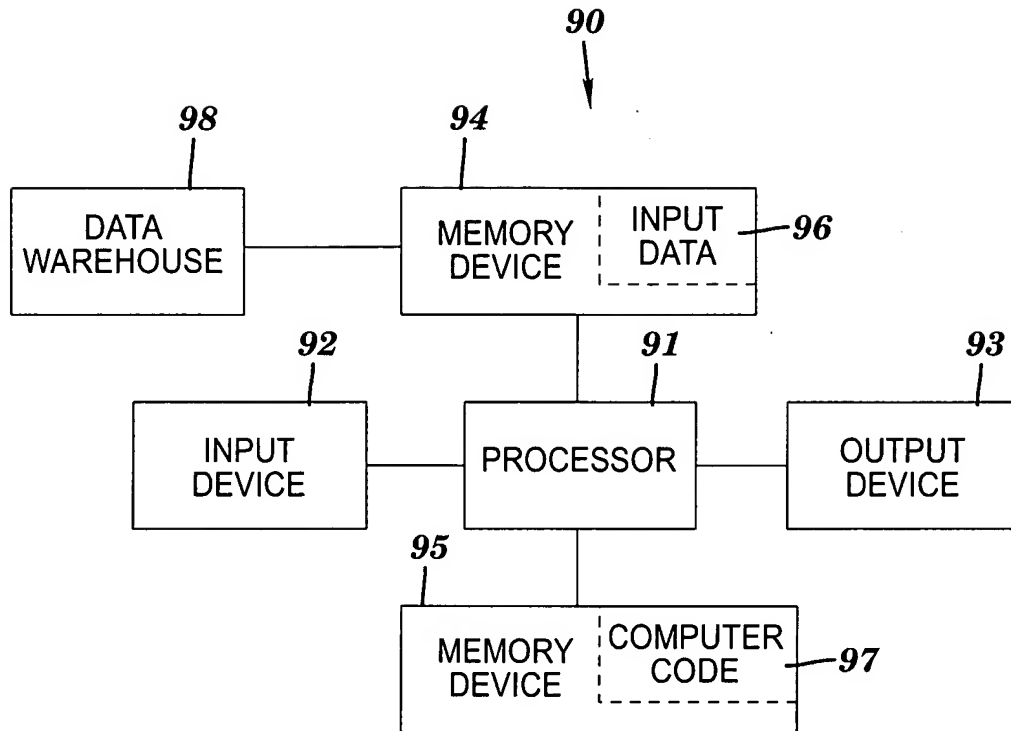


FIG. 33